

Application/Control Number: 10/069,768

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1. A method of passivating the surface of a solid material, comprising irradiating the surface of a solid material with a pulsed laser beam having a pulse duration no longer than the atomic vibration period of the solid material.
2. The method of Claim 1, wherein said solid material is a semiconductor.
3. The method of Claim 1, wherein said solid material is a compound semiconductor.
4. The method of Claim 1, wherein said solid material is a III-V compound semiconductor.
5. The method of Claim 1, wherein said solid material is gallium arsenide.
6. The method of Claim 1, wherein said laser emits radiation in a wavelength range from about 2 micrometers to about 50 nanometers.
7. A method of passivating the surface of a solid material, comprising irradiating the surface of a solid material with a pulsed laser beam having a pulse duration not greater than about  $10^{-11}$  seconds.
8. The method of any one of Claims 1-7, wherein said pulses have a duration not greater than about  $10^{-12}$  seconds.
9. The method of Claim 8, wherein said pulses have a duration not greater than about  $0.5 \times 10^{-12}$  seconds.

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10. The method of any one of Claims 1-7, wherein said pulses have an energy density in the range from about 0.01 mJ/cm<sup>2</sup> to about 100 mJ/cm<sup>2</sup>.

**11. (Amended) An article comprising a solid material having a surface passivated by the method according to any of Claims 1-7.**

CLAIMS 12-16 CANCELED

17. An article comprising a solid semiconductor having a passive surface bearing nanoclusters of atoms.

18. An article according to Claim 17, wherein said semiconductor is a compound semiconductor.

19. An article according to Claim 17, wherein said semiconductor is a III-V compound semiconductor.

20. An article according to Claim 17, wherein said semiconductor is gallium arsenide.